

REMARKS

In response to the Official Action of June 7, 2006, claims 13, 20-25 and 30 have been amended in a manner to more particularly point out and distinctly claim that which applicant regards as the invention.

In particular, in claim 13, it is pointed out that both the integrated circuit package and the circuit board are within said mobile phone. Support for this amendment can be found in Figure 4 of the application as filed and the corresponding description in the specification, including page 13, line 33 through page 14, line 29. Support for the claim amendments to claims 20-25 and 30 can also be found in Figure 4 and the specification, including page 13, line 33 through page 14, line 29.

Referring now to paragraph 2 of the Official Action, claims 1-5 and 7-34 are rejected under 35 USC §102(e) as anticipated in view of US patent application publication 2004/0257090, Barr et al (hereinafter Barr). Preliminarily, it should be noted that in applicant's previous amendment filed on May 11, 2006, claims 1-12 were canceled. Thus, the rejection of these claims under 35 USC §102(e) is in error.

With regard to independent claim 13, it is set forth at pages 4-5 of the Official Action that Barr discloses a system for analyzing connection conditions between an integrated circuit package (daughter board) and a circuit board (motherboard) comprising a plurality of elements as recited on pages 4 and 5 of the Official Action. However, the elements recited on pages 4 and 5 do not correspond to claim 13 as presented in applicant's amendment filed on May 11, 2006.

In particular, the arguments presented in applicant's amendment filed on May 11, 2006 at page 8, line 6 through page 9, line 27 are not addressed in the present Official Action. Claim 13 recites support elements directly connecting said integrated circuit package mechanically with said circuit board using solder balls, as well as

conductors configured to electrically connect at least two of the support elements with each other on the side of the integrated circuit package. It was pointed out in applicant's amendment filed on May 11, 2006 that contrary to the disclosure in Barr, no conductor is used for connecting the integrated circuit package to the circuit board but rather, the present invention discloses the use of support elements directly connecting said integrated circuit package mechanically with said circuit board using solder balls.

The present invention also discloses and claims conductors configured to electrically connect at least two of the support elements with each other on the side of the integrated circuit package, as well as a measurement device arranged at said support elements and configured to pick-off physical values between said support elements, and a determination device configured to evaluate said physical values in order to determine mechanical properties of said support elements and configured to conclude a condition of said electrical coupling of said integrated circuit package with said circuit board from said determined mechanical properties of said support elements.

As pointed out in applicant's prior amendment filed on May 11, 2006, use of solder balls provides that the support elements are directly bonded onto the circuit board. The connection between the integrated circuit package and the circuit board therefore requires very little space contrary to the disclosure in Barr. This is particularly advantageous for mobile phones and the like which are typically small-build devices.

It was also pointed out in applicant's amendment filed on May 11, 2006, that the direct coupling between the integrated circuit package and the circuit board using solder balls as support elements prevents the requirement to provide an additional component between the integrated circuit package and the circuit board. That is, it eliminates the need for a connector as required in Barr. Since none of these distinctions of the present invention as claimed in amended claim 13 were considered in the rejection of claim 13, it is respectfully submitted that claim 13 is not anticipated by Barr.

In particular, Barr is directed to a printed circuit assembly (PCA) with built-in circuitry to detect and communicate an interconnect failure. The PCA includes a connector, such as connector (102) shown in Figure 1, a continuity detect circuit (104) and an interface circuit (106). The connector is configured to interconnect to an electronic unit and the continuity detect circuit is coupled to the connector for detection of continuity failure in the interconnect. The interface circuit is coupled to the continuity detect circuit for communicating data pertaining to the status of the interconnect to the system management.

In the embodiment shown in Figure 6 of Barr, two or more pins (606A, 606H) of connector (602) are specifically designated for use in verification of proper IC seating (see paragraph 0037). This is typically performed by a first designated pin (606A) of connector (602) to be conductively connected to the continuity detect circuit (104) and a last designated pin (606H) of connector (602) electrically grounded with the possibility of additional pins all conductively connected to the first and last designated pins by a conductive route (608) (Barr, paragraph 0037). As stated in paragraph 0040, if the packaged IC is not properly seated in the connector (602), then there would be an open circuit such that the voltage on the last pin (606A) would be left floating.

It is therefore clear that Barr introduces an additional element; namely, the connector (102) for providing the analysis of the connection state in conjunction with the continuity detect circuit (104) and interface circuit (106).

More particularly, Barr relates to printed circuit assemblies with built-in circuitry to detect and communicate an interconnect failure. Due to stress, vibration, shock and other reasons, failures within interconnection systems may occur which can be difficult and costly to debug (Barr, paragraphs 0004-0007). In order to provide detecting continuity losses, Barr provides a connector (102) which is configured to interconnect to an electronic unit. In particular, continuity detect circuit (104) is coupled to the connector (102) for detection of continuity failure in the interconnect (Barr, paragraph

0007). The circuit, according to Barr, thus comprises an integrated circuit (100) onto which a connector (102) and a continuity detect circuit (104) are attached (Barr, paragraph 0019). According to Barr, the connector comprises two pins which are specifically designed for use in verification of proper card seating. By configuring the first and second pins towards opposite ends of the card, mis-seating of the card in the connector may be efficiently determined (Barr, paragraph 0021). For connecting an integrated circuit to the circuit board, there is provided a connector (102) onto which the integrated circuit is seated for connection with the printed circuit board (Barr, paragraphs 0024-0025; Figures 1, 2 and 6).

It is noted that in-between an integrated circuit, or an integrated circuit card, and the printed wiring board, a further element; namely, a connector (e.g., connector 102) is positioned (Barr, paragraphs 0036, 0039). In this respect, Barr discloses that in order to connect an integrated circuit package with a circuit board, an intermediate element; namely, a connector is required. The connector therefore needs to be connected to the circuit board and thereafter the integrated circuit is seated onto the connector. The connector in Barr therefore requires additional space between itself and the integrated circuit connected thereto. This means that the integrated circuit package cannot be directly bonded onto the circuit board, but instead a connector has to be placed in-between the integrated circuit package and the circuit board. This increases the size of an assembly of the integrated package and the circuit board.

The amendment currently made in claim 13 is to address the issue raised at page 2 of the Official Action under the section "Response to Argument" in that the mobile phone preamble is an intended use and is not given consideration during examination of the claim. Claim 13 now particularly points out and claims a mobile phone comprising a system in a manner which was believed to be clearly submitted previously. Nevertheless, it is now particularly pointed out and claimed that the integrated circuit package and the circuit board are both within the mobile phone. It is

believed that the mobile phone is a proper preamble limitation as interpreted under MPEP §2111.02, I. That is, the preamble is a statement limiting the structure of the invention and therefore must be treated as a claim limitation rather than just an intended use. The position as set forth in the "Response to Argument" in the Official Action of June 7, 2006 is therefore respectfully disputed.

For all of the reasons presented above, it is respectfully submitted that claim 13 is not anticipated by Barr and therefore claims 14-26, which all depend from claim 13, are believed to be further not anticipated by Barr.

Regarding independent apparatus claim 30, this claim is also rejected under 35 USC §102(e) as anticipated by Barr for the reasons set forth at page 3 of the Official Action. Claim 30 specifically recites support elements directly connecting said integrated circuit package mechanically with said circuit board using solder balls and conductors configured to electrically connect at least two of said support elements with each other on the side of the integrated circuit package. For the same reasons as presented above with regard to claim 13, these features of claim 30 were not considered in the rejection of claim 30 and are believed to not be anticipated by Barr. Therefore, for similar reasons as presented above with regard to claim 13, claim 30 is believed to be not anticipated by Barr.

Claims 31 and 32 are believed to be further not anticipated by Barr since they depend from claim 30.

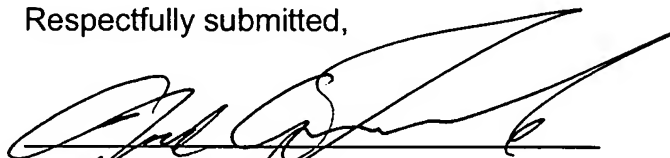
Independent apparatus claim 33 is rejected at paragraph 2 of the Official Action but no specific arguments are presented in the Official Action showing anticipation of this claim. Since claim 33, like claims 13 and 30, recites support elements directly connecting an integrated circuit package mechanically with a circuit board using solder balls, as well as means for electrically connecting at least two of the support elements

with each other on the side of the integrated circuit package, this claim is also not anticipated by Barr for the reasons presented above with regard to claim 13.

Since claim 33 is believed to be not anticipated by Barr, claim 34, which depends from claim 33, is further believed to be not anticipated by Barr.

In view of the foregoing, it is respectfully submitted that the present application as amended is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Alfred A. Fressola', written over a horizontal line.

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